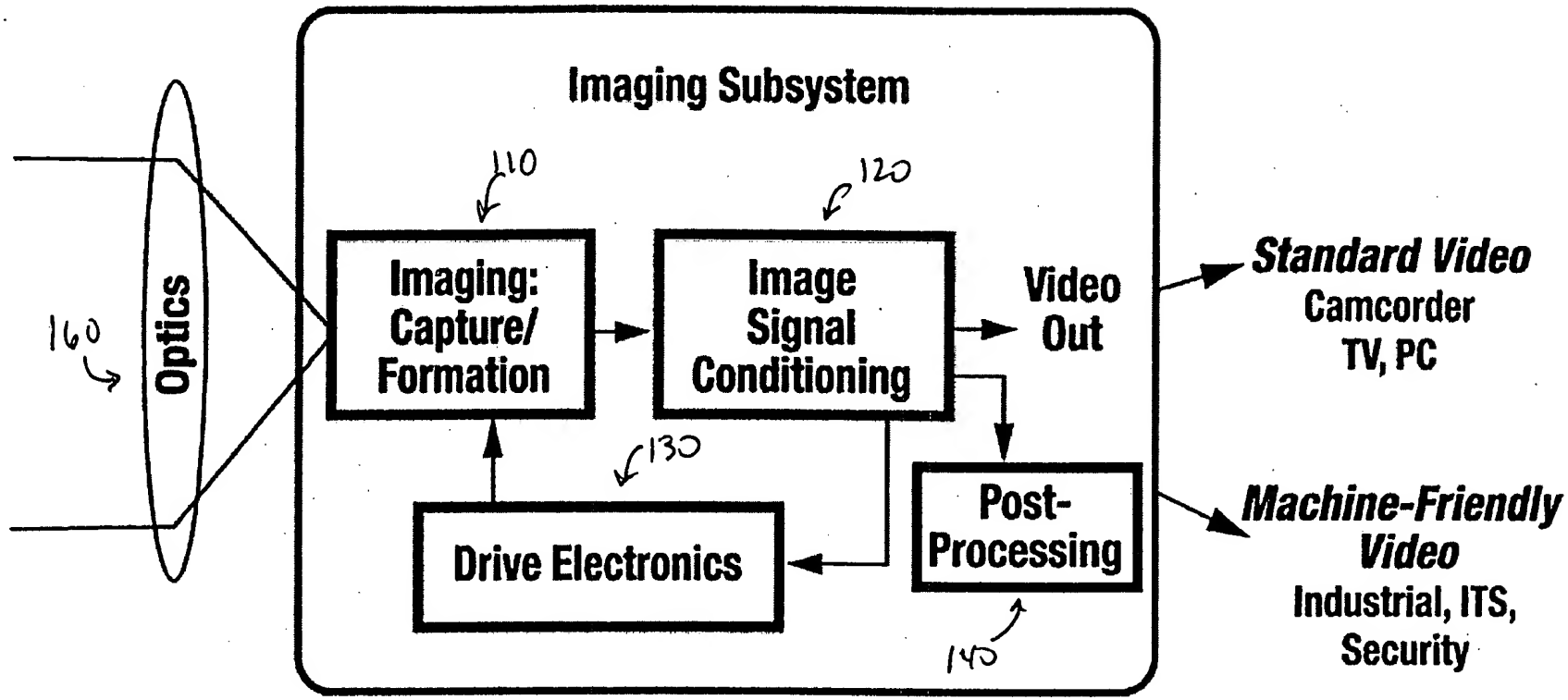
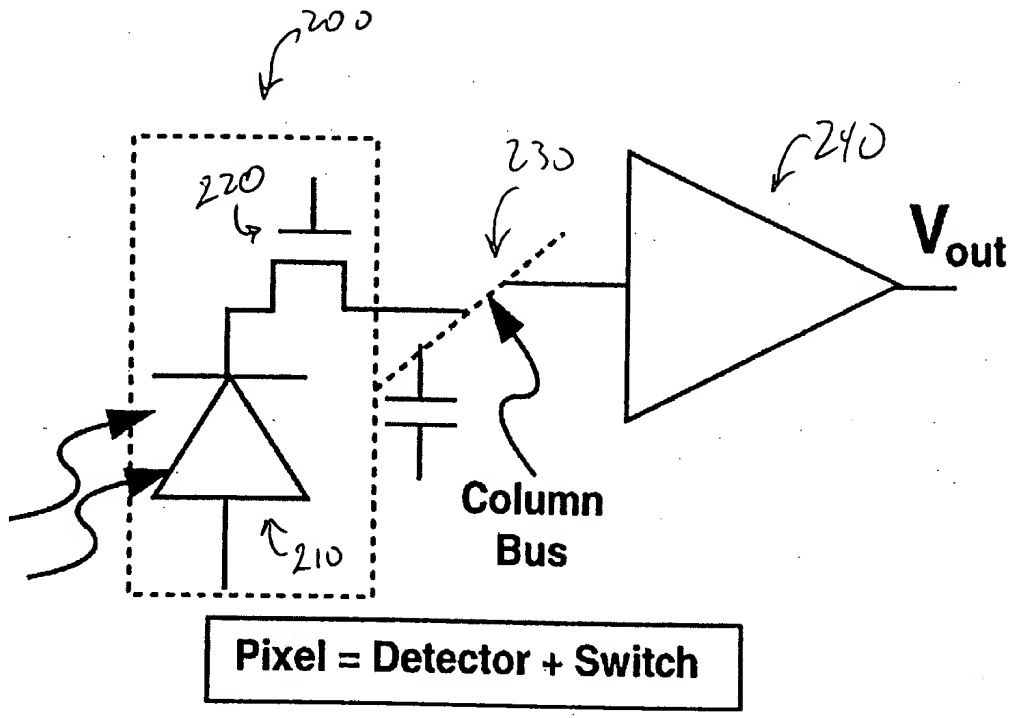
Figure 1


Imaging Subsystem
110
120
Optics
160
Imaging: Capture/ Formation
Image Signal Conditioning
Video Out
130
Drive Electronics
Post-Processing
140
Standard Video
Camcorder
TV, PC
Machine-Friendly Video
Industrial, ITS, Security
100

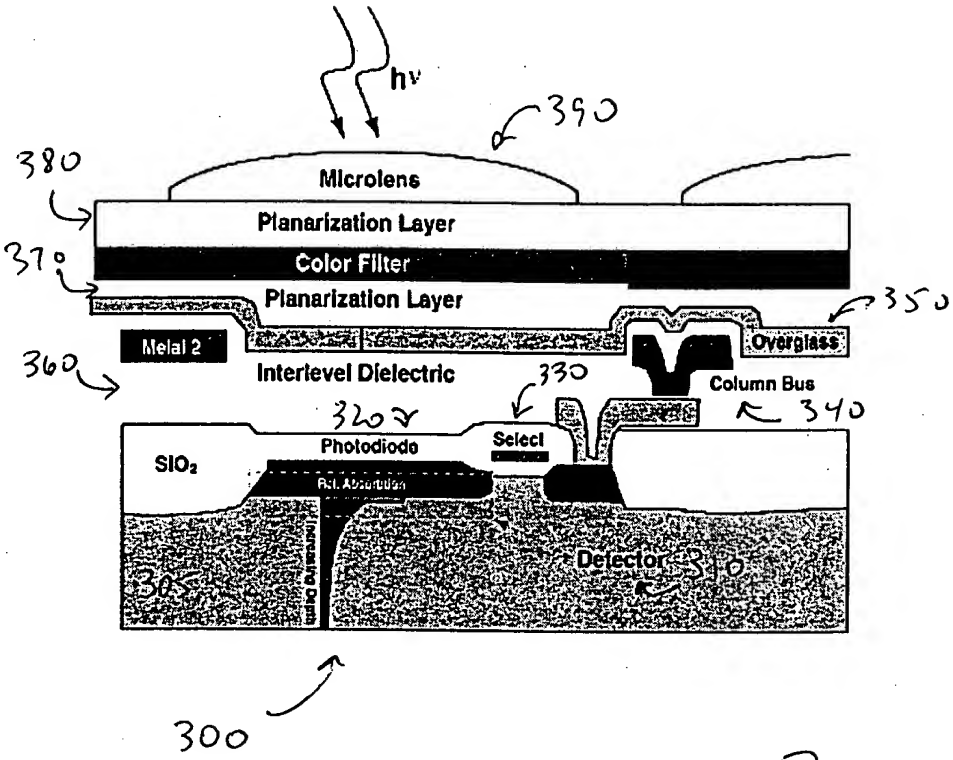
00h2h0" h5h25560

Figure 2



Prior Art

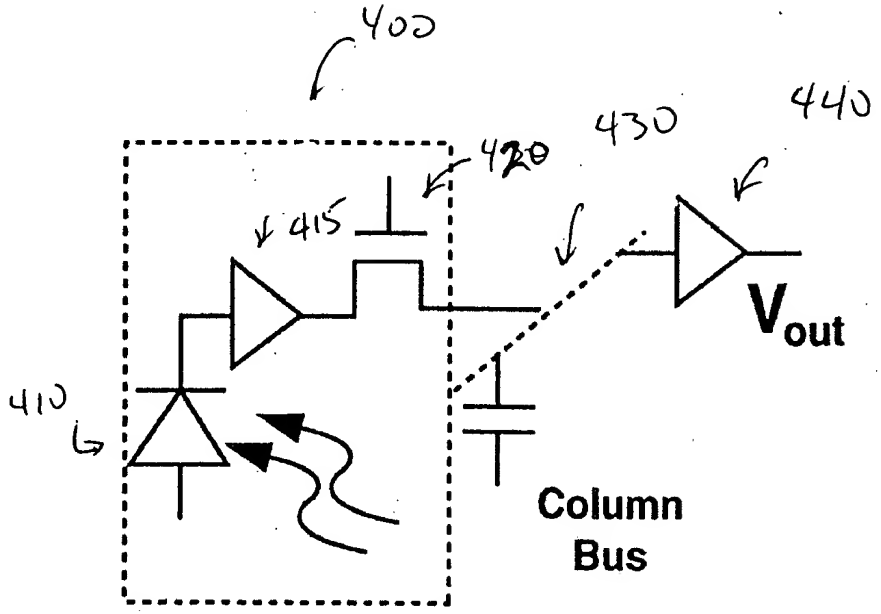
Figure 3



Prior Art

00h2h0" h5h25560

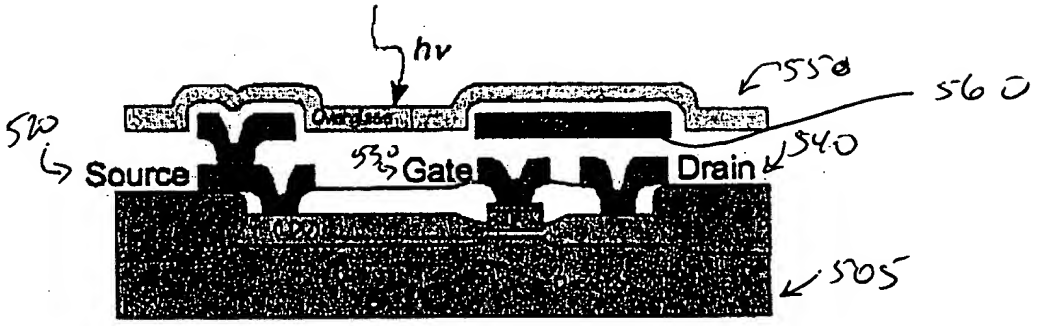
Figure 4



Pixel = Detector + Amplifer + Switch

Prior Art

Figure 5

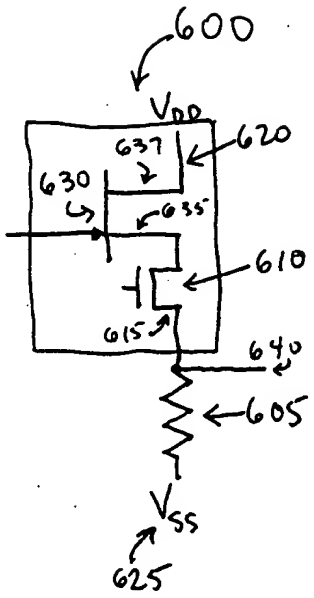


a) Amplified Pixel Cross-Section

500

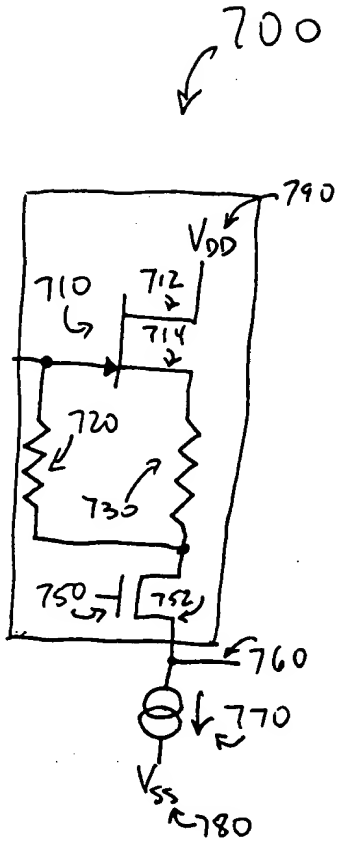
0955745.042400

Figure 6



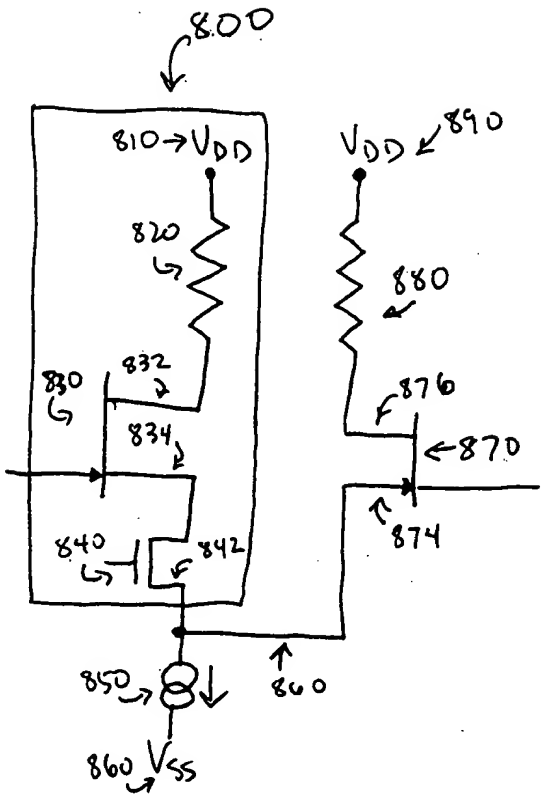
0054754.0042

Figure 7



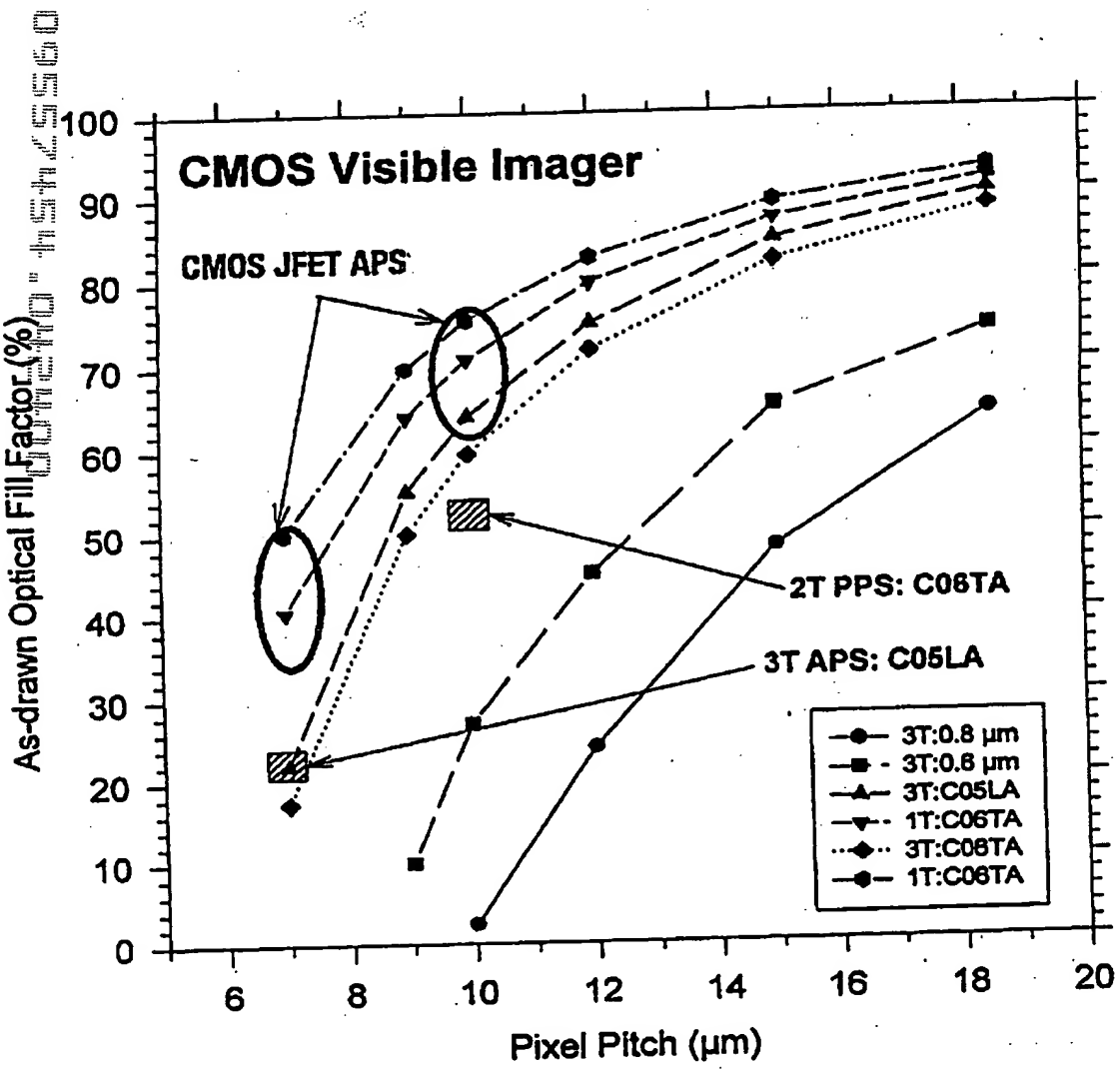
09457454 - 050404

Figure 8



0955454 - 0420400

Figure 9


CMOS Visible Imager
CMOS JFET APS
2T PPS: C06TA
3T APS: C05LA
3T:0.8 µm
3T:0.6 µm
3T:C05LA
1T:C06TA
3T:C08TA
1T:C06TA
As-drawn Optical Fill Factor (%)
Pixel Pitch (µm)
0
10
20
30
40
50
60
70
80
90
100
6
8
10
12
14
16
18
20

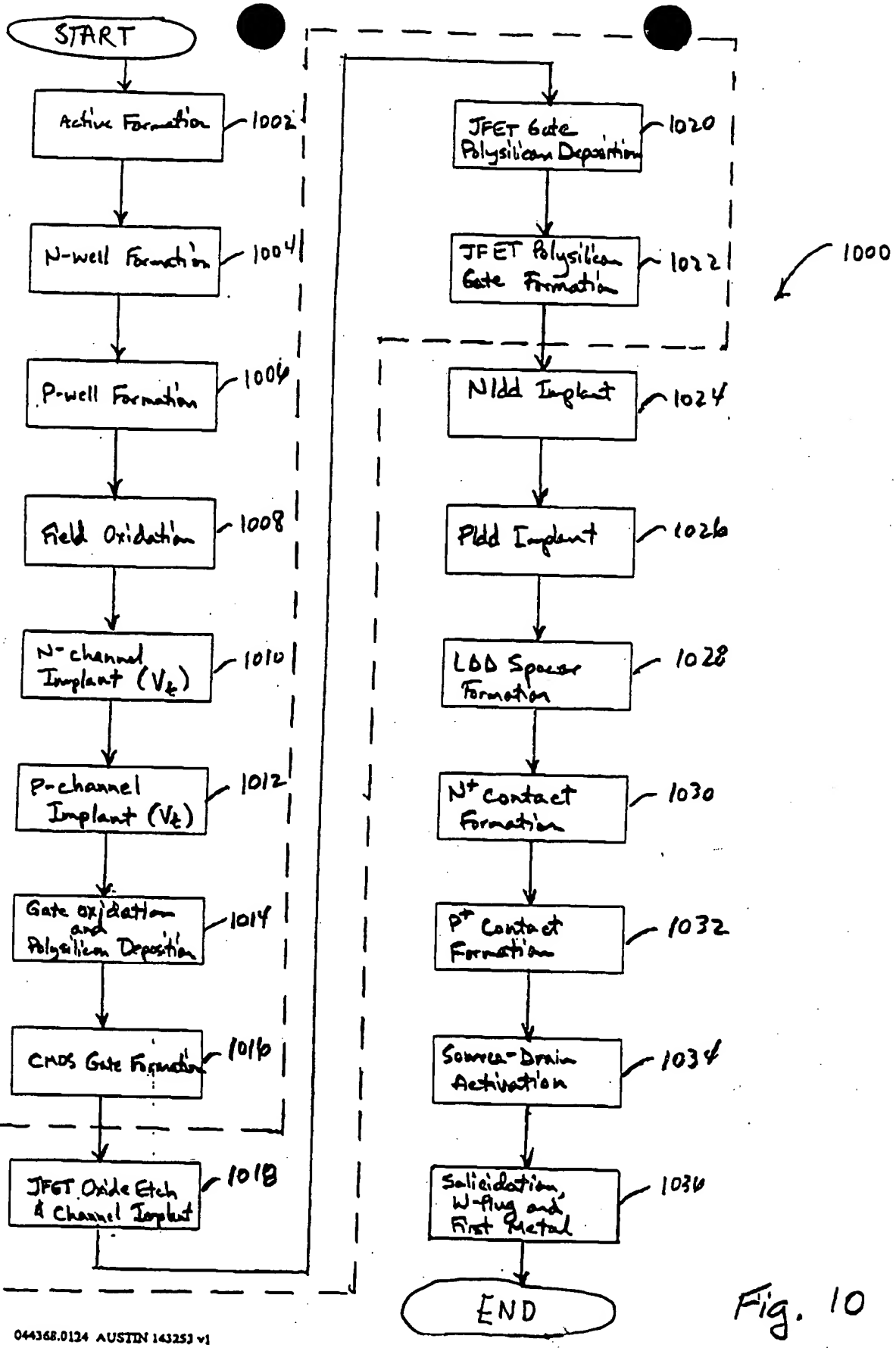

START
Active Formation
1002
N-well Formation
1004
P-well Formation
1006
Field Oxidation
1008
N- channel Implant (V_t)
1010
P-channel Implant (V_t)
1012
Gate oxidation and Polysilicon Deposition
1014
CMOS Gate Formation
1016
JFET Oxide Etch & Channel Implant
1018
JFET Gate Polysilicon Deposition
1020
JFET Polysilicon Gate Formation
1022
1000
NIdd Implant
1024
PIdd Implant
1026
LDD Spacer Formation
1028
N+ Contact Formation
1030
P+ Contact Formation
1032
Source-Drain Activation
1034
Salicidation, W-Plug and First Metal
1036
END

Fig. 10